

UDC 595.745(540)

## A NEW SPECIES OF THE GENUS *PARAPHLEGOPTERYX* (TRICHOPTERA, LEPIDOSTOMATIDAE) FROM INDIA

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Received 3 October 2011

Accepted 28 March 2012

**A New Species of the Genus *Paraphlegopteryx* (Trichoptera: Lepidostomatidae) from India.** Parey S. H., Singh Saini M. — A new species of genus *Paraphlegopteryx* Ulmer is described and presented from Indian Himalaya, namely *Paraphlegopteryx weaveri* Parey et Saini, sp. n. from Zemithang (Arunachal Pradesh) belonging to the *P. composite* group. As an addition to this genus the 15 valid species from India is represented. A key to all the 15 species of India which is modified after Weaver (1999) is provided.

**Key words:** *Paraphlegopteryx weaveri*, Lepidostomatidae, Arunachal Pradesh, India.

**Новый вид рода *Paraphlegopteryx* (Trichoptera, Lepidostomatidae) из Индии.** Парей С. Н., Сингх Саини М. — Новый вид рода *Paraphlegopteryx* Ulmer описан из Индийских Гималаев, а именно *Paraphlegopteryx weaveri* Parey et Saini, sp. n. относящийся к группе *P. composite*, из поселения Земитханг (штат Аруначал-Прадеш). В дополнении к этому роду представлены 15 видов из Индии. Приведена таблица для определения всех 15 видов (модификация Вивера (1999)).

**Ключевые слова:** *Paraphlegopteryx weaveri*, Lepidostomatidae, Аруначал Прадеш, Индия.

### Introduction

The genus *Paraphlegopteryx* Ulmer, 1907 (type species *Paraphlegopteryx tonkinensis* Ulmer, 1907 from Vietnam) is restricted to mountain areas of the Oriental Region, which includes India, Nepal to Arunachal Pradesh, Indochina and Southern China (Weaver, 1999). In India, it is confined to the hill states of Uttarakhand, Arunachal Pradesh, Manipur and Meghalaya. Currently, it is represented by 24 species distributed all over the globe and 14 species from India (Morse, 2011). The main contribution to study of this genus in India was made by Weaver (1999), who reported 12 species after examination of the collection of late F. Schmid. In addition to this, Martynov (1936) and Mosely (1949) each reported one species from India.

### Material and methods

Specimens examined in this study were primarily collected using a light trap consisting of 22 watt UV (ultraviolet or “black” light). Traps were placed near a high altitude mountain streams for 1–3 hours beginning from dusk, in Arunachal Pradesh in 2011. The caddis-fly material, collected this way, was killed and preserved in 70% ethyl alcohol with a drop of glycerin. For the detailed studies, the male genitalia were removed with the help of fine-tipped forceps and cleared with lactic acid procedure provided by Blahnik et al (2007). Morphological terminology follows Weaver (1988). The type specimen is preserved in 80% alcohol and is deposited in the Museum of the Department of Zoology, Punjabi University, Patiala, India.

### *Paraphlegopteryx* Ulmer, 1907

Type species: *Paraphlegopteryx tonkinensis* Ulmer, 1907.

### *Paraphlegopteryx weaveri* Parey et Saini, sp. n. (fig. 1–4)

**Material.** Holotype ♂, India, Arunachal Pradesh, Zemithang, 1800 m., 16 May 2011 (coll. Manpeet Singh) (deposited in the Museum Department of Zoology, Punjabi University Patiala, India). Paratypes: 2 ♂, from the same date and locality as that of holotype.

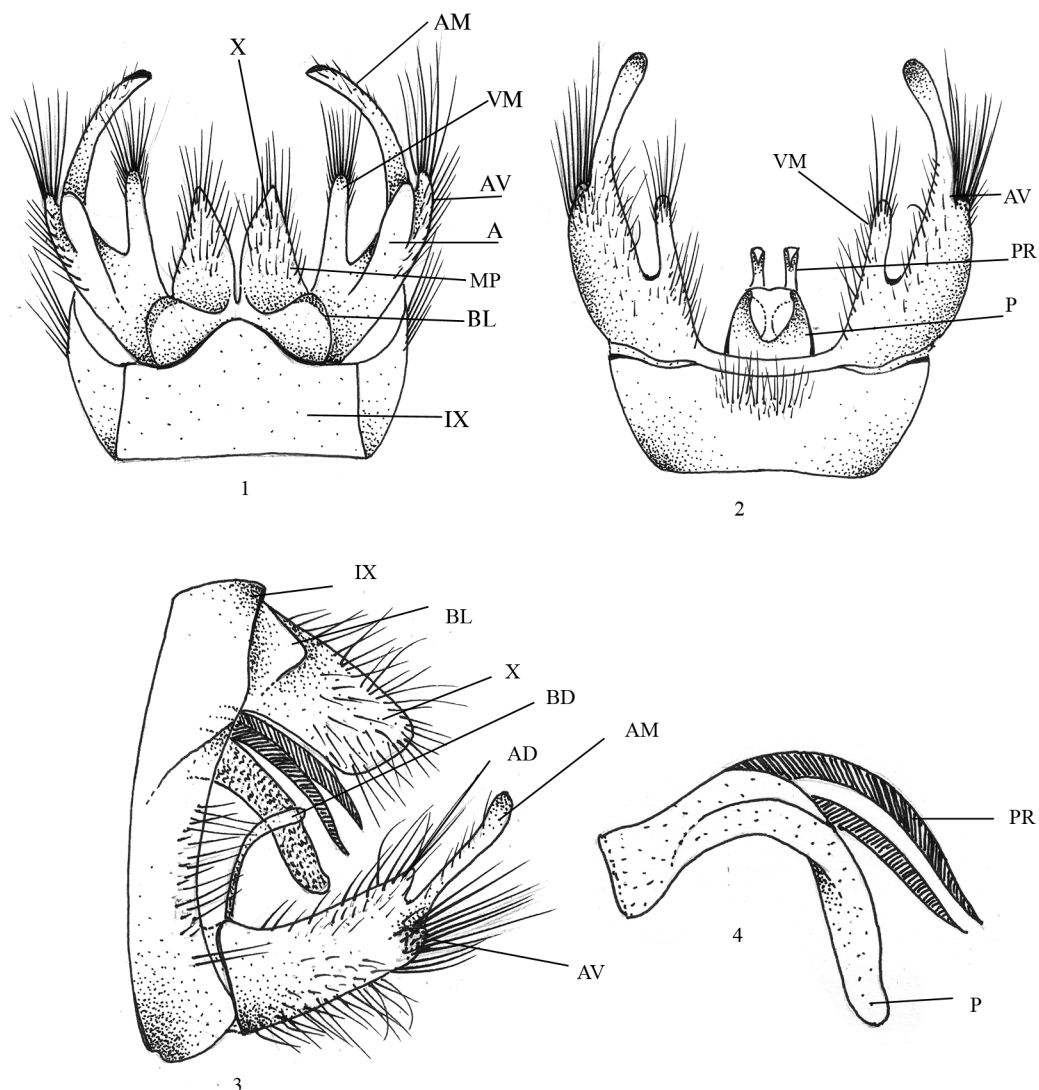


Fig. 1–4. *Paraphlegopteryx weaveri*: 1 — male, dorsal view; 2 — male, ventral view; 3 — male, lateral view; 4 — male, phallus left lateral view. Legend: AM — apicomeseal process, AD — apicodorsal process, AV — apicoventral process, BD — basodorsal process, BL — basolateral process, MP — mesal process, VM — ventromeseal process, P — phallus, PR — parameres, IX — segment IX, X — segment X.

Рис. 1–4. *Paraphlegopteryx weaveri*: 1 — самец, вид сверху; 2 — самец, вид снизу; 3 — самец, вид сбоку; 4 — самец, фаллус, вид слева, сбоку. Условные обозначения: AM — апикомезальный отросток, AD — апикодорсальный отросток, AV — апиковентральный отросток, BD — базодорсальный отросток, BL — базолатеральный отросток, MP — мезальный отросток, VM — вентромезальный отросток, P — фаллус, PR — парамеры, IX — сегмент IX, X — сегмент X.

**Diagnosis.** The new species resembles *P. moselyi* Weaver and *P. squamalata* Weaver, but differs from the former by having segment IX apicodorsally rounded (truncate in *P. moselyi*). Segment X triangular and apically acute (rounded in *P. moselyi*) in dorsal view; laterally rectangular not rounded; basolateral processes quite prominent and rounded (short and triangular as in *P. moselyi*). Inferior appendage with ventromeseal processes prominent and finger-like (reduced in *P. moselyi*), laterally main article rounded apically (trapezoidal in *P. moselyi*) Parameres apically tapering (rounded in *Paraphlegopteryx moselyi*). New species differs from *P. squamalata* Weaver by having well developed ventromeseal processes (reduced in *P. squamalata*).

**Description.** Adult. Scapes, head, thorax and wings dark brown. Abdomen light brown. Head setose without scales (in alcohol). Average length of scapes — 0.48 mm, maxillary palp — 0.30 mm, forewing — 8.73 mm.

**Male genitalia.** Segment IX apicodorsally produced into a rounded structure at its centre but almost rectangular in lateral view. Segment X with basolateral process quite prominent, rounded apically, appearing as small hump-like projection in lateral view; mesal process triangular in dorsal view and rectangular in lateral view. Inferior appendage broadened near base appearing rectangular in lateral view, apically 4 branched, apicoventral branch reduced, apically rounded, acuminate bearing a tuft of setae in lateral view, slightly pointed in ventral view; main article (apicomesal branch) longer than other branches, slightly pointed apically in dorsal view, rounded in ventral and lateral view; apicodorsal dorsal branch triangular in lateral view, roundly pointed dorsally; ventromesal branch about as long as segment X in dorsal view, fingerlike. Basodorsal process long, slender and curved posteriad. Phallus with phallobase, truncate and phallocrypt rounded apically rounded in lateral view. Parameres slightly shorter than phallus, apically tapering.

**Etymology.** The new species is named after J. S. Weaver for his outstanding contribution to Indian Lepidostomatidae.

#### Key to Indian species of *Paraphlegopteryx*

#### Таблица для определения видов рода *Paraphlegopteryx*

1. Hindwing thyridial cell long and broad, expanded from base to submargin, and densely covered with dark brown scales, and nygmatal cell compressed between discal and thyridial cells (fig. 6), *composite* group. .... 2
- Hindwing thyridial cell short and truncate and not extending beyond discal cell and with scales either sparse or absent, and nygmatal cell broader than thyridial cell (Weaver, 1999: fig. 44–48, 103–105). .... 7
2. Ventromesal process absent (Weaver, 1999: fig. 34). .... 3
- Ventromesal process present (fig. 1, 2). .... 4
3. Apicoventral process quite prominent (Weaver, 1999: fig. 32). .... *P. orestes* Weaver
- Apicoventral process reduced (Weaver, 1999: fig. 22). .... *P. moselyi* Weaver
4. Apicomesal process present (Weaver, 1999: fig. 14, 16, 18, 20). .... 5
- Apicomesal process absent (Weaver, 1999: fig. 38, 40). .... 6
5. Inferior appendage apicoventral process long slender and capitates (Weaver, 1999: fig. 14). .... *P. composita* Martynov
- Inferior appendage apicoventral process short and stout (Weaver, 1999: fig. 18). .... *P. kamengensis* Weaver
6. Segment X ellipsoidal in lateral view (Weaver, 1999: fig. 38), basolateral process short (Weaver, 1999: fig. 39); inferior appendage apicoventral process longer (Weaver, 1999: fig. 38). *P. squamalata* Weaver
- Segment X squarish in lateral view (fig. 3), basolateral process prominent (fig. 1); inferior appendage apicoventral process reduced (fig. 2). .... *P. weaveri* sp. n.
7. Segment VIII with dorsal scent gland, having either tergite VIII bulbous and Tergum IX usually concave anteriorly (Weaver, 1999: fig. 49, 56, 64), or tergite VIII reduced and not bulbous, and Tergum IX always concave anteriorly, and terga VIII & IX with expanded intersegmental membrane, (Weaver, 1999: figs. 78, 89, 95) *normalis* group. .... 8
- Segment VIII without dorsal scent gland, having terga VIII and IX both normal, (Weaver, 1999 figs. 106, 110), *tonkinensis* group. .... 14
8. Tergum IX normal, not concave anteriorly; tergite VIII with ovoid projection (Weaver, 1999: fig. 56). .... 9
- Tergum IX concave anteriorly; tergite VIII either with spherical projection or reduced with expanded posterior membrane region (Weaver, 1999: fig. 78). .... 10
9. Head without scales, scape and setal warts with many large dark brown setae; frons and dorsum concave (Weaver, 1999: fig. 70). .... *P. ivanovi* Weaver
- Head with scales, scape and dorsal setal warts with combination of setae and slender light brown clavate scales, frons and dorsum not concave (Weaver, 1999: fig. 2). .... *P. aykroydi* Weaver
10. Tergite VIII bulbous (Weaver, 1999: fig. 49, 82); mesoscutellum cordate and dark brown (nearly black), contrasting strongly with light brown mesoscutum (Weaver, 1999: fig. 7). .... 11
- Tergite VIII not bulbous (Weaver, 1999: fig. 78), mesoscutellum triangular and brown, only slightly darker than light brown mesoscutum. .... 12

11. Segment X apex bilobed in lateral view, and tergum IX broad (Weaver, 1999: fig. 82). ..... *P. normalis* Mosely
- Segment X apex acuminate in lateral view (Weaver, 1999. figs. 64), and tergum IX narrower (Weaver, 1999. fig. 64). ..... *P. bulbosa* Weaver
12. Segment X long, at least 2X basal widths in lateral view (Weaver, 1999: figs. 71, 95); forewing without scaly basal fold in anterior margin. .... *P. schmidi* Weaver
- Segment X shorter (Weaver, 1999: figs. 78, 89); forewing with scaly basal fold in anterior margin. .... 13
13. Inferior appendage with ventromesal process (Weaver, 1999: fig. 80). ..... *P. martynovi* Weaver
- Inferior appendage without ventromesal process (Weaver, 1999: fig. 91). ..... *P. portipae* Weaver
14. Inferior appendage apicomesal process tapering (Weaver, 1999. fig. 120); ventromesal process present (Weaver, 1999: fig. 120). ..... *P. pippini* Weaver
- Inferior appendage apicomesal process rounded (Weaver, 1999. fig. 139); Ventromesal process absent (Weaver, 1999: fig. 141). ..... *P. ulmeri* Weaver

The authors are highly thankful to Dr. J. C. Morse (Clemson University) for his many fold help. Thanks to University Grants Commission (UGC), New Delhi for providing financial assistance in carrying this research work. Laboratory facilities provided by Punjabi University, Patiala is highly appreciated. Material collected and provided to me by Manpreet Singh is put on record. Help rendered by Vikram Singh Rathor, Muzamil Ahmad and Lakhwinder Kaur is thankfully acknowledged.

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